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The Art
and
Science
of
Gilding

FORD & MIMMACK



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THE ART AND SCIENCE OF GILDING

A HAND BOOK OF INFORMATION FOR THE PICTURE FRAMER

*Practical instructions in the art of gilding picture
frames. Information that will enable anyone
to finish frames in
GOLD AND SILVER LEAF, BRONZE
AND DUTCH METAL*

*Formulas for compounding the different materials
used; also receipts for mixing and handling
compo, and the making of cement molds,
together with much valuable infor-
mation acquired through more
than a quarter of a century
in the gilding business*

Compiled and published by

FORD & MIMMACK

190-196 Edinburgh St.



Rochester, N. Y.

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PREFACE

During the past few years, we have received many requests from retail picture frame dealers for information that would enable them to do their own re-gilding. Books have been written on the subject; but nothing practical has ever been published. Having followed the trade of Picture Framing and Gilding for nearly thirty years, we have put into this little volume some of the knowledge acquired; and have endeavored to explain the different processes used by gilders.

In a factory, an apprentice has to work about four years before he is looked upon as a competent gilder. Even then, there is much necessary information that he may not have acquired. Employers and foremen usually keep secret many of the formulas, and give the workmen the materials mixed, ready for use.

In this book, all of these formulas are given, with explicit directions for compounding them; and with its aid, one with ordinary intelligence and a few weeks of practice, can do very creditable work. The beginner will doubtless be awkward and clumsy, especially in handling the leaf; but a little practice will soon overcome the difficulty. As no special aptitude is required, anyone can

become a good gilder. Besides instruction in the process of laying Gold, Silver and Metal Leaf, and the use of Bronze, valuable information is given for restoring old prints and engravings which may have become discolored.

In addition to the formulas used by gilders, we give instructions for making the composition (usually called compo) from which the ornaments are made. When doing re-gilding work, this is a necessary article to replace missing or to repair broken ornaments.

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The Art and Science of Gilding



GILDING.

In using the word "gilding," we do not refer to gold plating; but to the process of applying gold or silver leaf to a moulding or frame, as it is practiced by the picture frame manufacturers and dealers.

There are two styles of dull gold work; oil gold and matte gold. (These are produced by different processes which will be explained.) In contrast to these dull effects is the bright or burnished gold.

In doing over old work, it is customary to burnish the parts that were originally burnished; but on new work, the gilder has to select the parts that it is advisable to burnish. Sometimes it will be the entire top of the ornament; but usually, to give the best effects, the higher parts are selected.

On the smooth parts of the frame, the concave places (called hollows) and the convex parts (called beads) are the parts generally burnished.

It will be found that the hollows and beads are easier

to burnish than the flats, and the wider the flat, the harder it is to accomplish good work.

As a great amount of the gilding done in retail stores is the refinishing of old frames, we will take up this class of work first and more in detail.

We wish to impress on the beginner as strongly as possible, the necessity of preparing the frame. If it is not prepared properly, good work cannot be done. It is just as essential to have the preliminary work carefully executed, as any other part of the process. This work, if slighted by the gilder, will in time come to light; and it will be necessary to regild the frame.

REGILDING OLD FRAMES.

The first thing to be considered is the condition of the frame. If it be loose at the joints, it will be necessary to take it apart and rejoin.

If any of the ornaments are loose, they should be removed and glued on again; or, if missing, they must be replaced.

If pieces have been broken off the ornaments, all that may be necessary is to take a piece of soft compo (Formula 20), dip it in hot water, and press it on the broken place; then mould the compo, as near as you can, to the shape required, using the fingers and a stick or knife. It will be found that, by dipping the stick in water, or by using saliva, the compo will work more readily.

If so much of the ornament is missing that it is not practicable to mould it by hand, it will be necessary to make a compo mould. (Formula 21.) The gilder will then be able to supply the missing parts by using this mould (See instructions for casting on page 60.)

This will do in nearly all cases; but when there is a frame with the ornament missing from the entire side, it may be necessary to make a cement mould to accomplish better results. (See Formula No. 22.)

PUTTYING.

Next putty the mitres and all cracks that there may be in the coating of whiting which covers the wood. To do this properly, take a sharp pointed knife and scrape or cut along the crack, making it larger, and leaving it in a V shape, so that the putty may be pushed down to the bottom.

Take a piece of putty (Formula No. 2) about the size of a walnut. As the heat of the fingers will cause the putty to gradually become dry, slightly moisten it from time to time as needed. Most gilders use spittle for this purpose.

The putty is put into the cracks with a putty stick. This is a piece of hard wood, about four inches long, one-half inch wide and one-eighth of an inch thick, pointed at one end, rounded at the other and sharpened on the edges. Fill the crack with putty, leaving the top in a rounded shape, as the putty shrinks a little in drying.

In a very wide crack, the putty may check or crack in drying. In such a case, it is best to cut away the whiting down to the wood for at least three-eighths of an inch on each side of the crack. Then glue a heavy piece of canvas to the wood thus exposed. After this is dry, fill in with putty, and smooth as we are about

to describe. This canvas treatment is used only on flats that persist in cracking, but it is not necessary where the surface is ornamented. As the putty will in most cases fill the cracks, it will seldom be necessary to use this method.

Cut or ream out and fill with putty all the nail holes, leaving the top of the putty rounded. This is done so that there will be sufficient putty in the cracks and nail holes to leave them flush with the surface after they have been sandpapered and smoothed.

REWHITENING.

If, in regilding a frame on the style of an old-fashioned mirror frame, where there are no ornaments, it is found that the whiting is so badly cracked that it is practically impossible to put it in condition for gilding by puttying, it is advisable to entirely remove the whiting, and coat it over again.

To remove the whiting, take a large pail of saw-dust and pour water on it until the saw-dust becomes thoroughly soaked. Put the frame on the floor, face side up, and pack the wet saw-dust two or three inches thick, upon and around the whiting to be removed. Allow this to remain for at least two days, occasionally pouring water on the saw-dust, to be sure that it remains thoroughly wet.

Then with a knife scrape off the whiting, and after doing so, allow the frame to become perfectly dry before applying the whitening.

First, rejoin the frame, as the soaking will have made that necessary. Then give the frame a liberal coat of thin white. (Formula No. 3, using brush No. 7. When dry, give five heavy coats of thick white (Formula No. 4, also with brush No. 7), and have the first coat of thick white smooth and heavy. The second coat must be what is called a tap coat; applied

by tapping the thick white on, instead of brushing it on. This will produce a rough effect, and serve to make the third coat (which is put on like the first, thick and smooth) adhere better. The fourth is a tap coat, like the second, and the fifth and last, a smooth coat. Allow each to dry before applying the next.

After these coats are dry, the frame will be ready for smoothing. A piece of pumice stone, shaped the reverse of the moulding on the frame, will be needed. Before soaking the frame to remove the whiting, shape the pumice stone by taking a piece of sandpaper and placing it over the moulding, face side out. Then by rubbing the pumice stone on the sandpaper, the shape required can soon be obtained.

Next, take a bowl of water and brush (No. 8). Wet the frame well, and dip the pumice stone in the water before using; then rub it over the frame until the whiting becomes smooth and shapely.

After allowing it to dry, smooth it again, first with No. 1 and then with No. 0 sandpaper. Brush off with a duster, and the frame will be ready for the preparations used in gilding.

SANDPAPERING.

First, select the parts which are to be burnished. The parts chosen must be well sandpapered, leaving none of the old gold or bronze on the surface. Sandpaper until the composition is quite clean. If this is not done properly, the thick white, which is the first preparation for burnished ornaments, is liable to crack or chip off when the burnisher is applied.

As a rule, the flats on old frames will not permit of either burnish or matte work, owing to the age of the preparation, and the fact that these flats show the cracks more than ornamented surfaces. Hollows, beads and flats on regilding work, must be in first-class condition if they are to be burnished or laid in matte. If not in good condition, they would be better laid in oil, then the cracks will not show so plainly.

On new work, the flats, beads and hollows will require no thick or thin white, as they are well prepared, and will need no attention on the part of the workman except puttying the mitres, and sandpapering smooth.

PREPARING.

After the ornaments to be burnished are well sand-papered, place the cup of thin white (Formula No. 3) in a pan of water, and heat until melted.

Take a brush (No. 7) and go over the entire frame. Do not apply this thin white as you would apply paint, but dab it down in and around the ornaments. The tops of the ornaments will take care of themselves. After the section of frame is well covered (but not flooded), do not work over again. Allow this coat to dry.

Now melt the thick white (Formula No. 4) by letting it stand in fairly warm water; but do not allow it to become hot. The thick white is now used for the tops of ornaments that are to be burnished, and is applied to the ornaments by using a brush (No. 3).

Put it on thick and smooth, practically flowing it on; yet not so thick that it will run off the ornaments.

Give two coats of the thick white, and be sure to allow the first coat to become thoroughly dry before applying the second. These two coats of thick white are to be applied only to the tops of the ornaments that are to be burnished, the ornaments having already received a coat of thin white.

When the coats (one of thin white and two of thick

white) are dry, which will take about one-half hour, take a brush (No. 8) and a bowl of cold water. Dip the brush in water and apply it to the ornamented part of the frame; brush it hard, down around the ornaments and take up with the brush the whiting that is thus washed off. Squeeze the whiting out of the brush and dip in the water again, continuing this until all of the ornamented parts of the frame have been treated. Take up with brush all surplus water.

While thus dabbing or rubbing the ornaments with the brush, use the other hand to rub the tops of all ornaments, particularly those to be burnished. This aids in smoothing, also in keeping the original shape of the ornaments. In smoothing the flats, it is advisable to use a damp cloth instead of a brush. Then set the frame aside to dry.

When the frame has become perfectly dry, sandpaper all parts that can be easily reached with No. 0 sandpaper, giving the parts that are to be burnished an extra treatment with sandpaper No. 00. In sandpapering ornaments, be sure that they are not flattened by continuous rubbing; but take care to work the sandpaper so as to retain the shape of the ornaments.

The frame must be dusted carefully, particularly around the ornaments. It is advisable to first turn the frame down, and knock lightly on the back with a

piece of wood, then dust with a brush (No. 12), which should be kept for this purpose only.

After removing the frame, take a wet cloth and wipe off all the dust from the bench. This is better than using a duster, for it dampens and settles the dust; while, if a duster is used, it may send the dust all over the room, sticking to any frames that may be ready to gild.

It is advisable to do all the preparing and gilding in a room as free from dust as possible; and, in case it is necessary to sweep while preparing work for gilding, cover with paper the frames and preparations, until the dust has settled.

SHELLACING.

When the frame has been well dusted, it is ready for a coat of shellac (Formula No. 5). It is necessary to cover with shellac all parts of the frame, excepting those parts that are to be burnished. If this is not done, the whiting will absorb the oil size, and the gold leaf will not adhere.

Apply the shellac (Formula No. 5) to the ornaments first, leaving the flat parts of the frame to be shellaced last. To put it on the frame, use a brush (No. 11), and apply by dabbing it down and around the ornaments. The gilder should be very careful to see that none of the shellac gets on the parts to be burnished. Should it run over on these places, wipe it off with the finger. It is best to first take a brush (No. 2) and cut around the parts to be burnished with the shellac. By doing this, one may use the larger brush with less care in shellacing the remainder of the frame.

Do not flood the ornaments with shellac; but cover them well, using care to get down, in, and around them; then wipe up the shellac so there will be no runs. When the ornaments are finished, and the flats ready to be shellaced, there must be no runs or partly shellaced places which would show badly when gilded.

When shellacing flats, start at one corner of the

frame, and draw the brush to the opposite corner, laying the shellac as smoothly as possible.

When the frame is perfectly dry, examine the flats closely, also down, in and around the ornaments. If the shellac has soaked in, or some places have not been covered, give these parts a second coat. This can be done on ornaments without going over the entire frame, by using a smaller brush; but, if any part of the flat surface is not properly covered, it will be necessary to go over all of that flat again. It is not advisable to try to patch flats with shellac, for they will show very plainly when laid in gold. Bear in mind that flat surfaces on frames must be shellaced as smoothly as possible in order to secure good results.

After the frame is coated with the shellac, take a piece of cheese cloth, wet it in alcohol, and wipe off thoroughly all the places that are to be burnished; for, in shellacing the frame, some of the places to be burnished may have been touched with the shellac. If not removed, these parts will chip off when the ornaments are burnished.

PREPARING ORNAMENTS FOR BURNISHING.

The ornaments are now ready to receive three coats of burnish size. Place the cup containing the gold burnish size (Formula No. 9) in a pan of warm water. If this is allowed to become hot, it will pin-hole; so be careful to heat it just enough to melt it. Stir the size while in process of melting, and after it is melted, remove it from the pan of hot water.

Take a brush (No. 3) and dip it into the size. Do not wipe the size off the brush in the edge of the cup, but use the quantity of size which naturally adheres to the brush.

Flow this on to the tops of the ornaments to be burnished. Do not flood it on so thick that it will run off on the parts that are not to be burnished; but give the ornaments a heavy coat, letting each coat dry before applying the next. It will take about fifteen minutes for each coat to dry.

If flats or hollows are to be burnished, do not use the burnish size as freely as on the ornaments, but be particular to lay it as smoothly and evenly as possible, after the manner of applying paint.

When the third coat is dry, take a small piece of No. 00 sandpaper and rub it on the face of a larger piece. This will remove the heavier sand from the

surface. Then take the smaller piece and split it—that is, separate the two layers of paper by peeling off the back. This will leave the sandpaper thin, and it will work better on the burnished parts, as the thick sandpaper might cut through the size. Sandpaper the parts to be burnished with the split sandpaper, which will not remove the size, but will smooth it and give it a polish.

APPLYING OIL SIZE.

After sandpapering, dust the frame, which is then ready to be given a coat of oil size. (Formula No. 10.)

For this purpose, use brush (No. 7). Do not apply the oil gold size as paint is applied; but dab it down, in and around the ornaments, using as little oil as possible. It will be found that it requires very little oil to cover a good sized frame.

All parts should be carefully covered, but the thinner the oil is applied, the better will be the result. If too much oil has been applied a skin will form over it, leaving wet oil beneath; and, when the gold is applied, this skin will break and cause trouble. Do not use the oil too freely, but be sure that all parts are covered. Look over the frame, and if any hairs from the brush are found sticking to it, carefully remove them.

After the frame is oiled, take a cloth that is free from lint, and moisten it with benzine. With this, wipe off all parts that are to be burnished, but do not let the cloth touch any of the oiled parts which are not to be burnished; for, if this happens, the gold will not stick. When the burnished parts have been carefully wiped, set the frame away out of the dust, and leave for about 16 to 24 hours.

It is advisable to oil the frame in the afternoon and

leave it until the next morning. It can be gilded any time during the following day.

If one wishes to oil a frame on Saturday so as to gild on the following Monday, omit the Japan dryer; then the oil will not dry so quickly.

LAYING THE GOLD ON FLATS.

The frame is now ready to be laid in oil gold, or, in other words, the dull dead gold. Before doing this, we would advise wiping off once more the parts to be burnished, using a cloth free from lint, and wet with benzine. The reason for this is, that some spots of oil may have been left on those parts, and unless they are removed, the burnishing will not come out bright and clear.

When this has been done, take a book of gold leaf, and blow a few leaves out on the back of the gilder's cushion. (See pages 49 and 50 for instructions for handling cushion and cutting gold.) It is best to blow out but one or two leaves at first, until one has become accustomed to handling it and has acquired the knack of picking up a leaf with the point of the gilder's knife, placing it on the front of the cushion, and blowing it out flat. The gold can then be cut any size required.

In blowing out the gold, do not blow hard or long, but place the mouth over the centre of the leaf, and about four or five inches away. Give a light, sharp puff, about as strong as is necessary to blow a crumb from the end of the tongue. This will become easy after a little practise.

It is customary to gild the flats first. For a flat surface an inch wide, cut the gold about one and one-fourth inches wide. This will allow for putting it on unevenly, as one undoubtedly will at first. If one were to cut it the exact size to cover, and did not get it on true, it would be necessary to lay on another full-sized piece, and that would take more gold than if a little were allowed for unsteadiness. Of course as one becomes more expert, one can cut closer to the size required.

LAYING GOLD ON ORNAMENTS.

After cutting the leaf of gold to the size required, as instructed on page 50, place the hairs of the tip on the piece of gold which is to be used, and it will adhere to the tip. Be careful to hold the tip squarely and evenly when bringing it in contact with the gold; then lay the piece of gold flatly and as evenly as possible on the place it is to cover. The gilder will probably be very awkward at first, and will make many slips, but it becomes easy after a little practice. Next apply the second piece, allowing it to lap over the first at least one-quarter of an inch.

After all flats or smooth surfaces are covered, lay gold on the ornaments. This does not require as much care as when laying the flats; as the laps will not show so plainly on the uneven surface. However, it requires more gold leaf to gild an ornament, than it does to gild a smooth, flat surface.

In applying the gold leaf to ornaments, do not put the leaf on flat as one would on a flat surface; but hold the tip so that one end of the leaf will strike the ornament first; then allow the balance of the leaf to come down, in and around the ornament. This will cover the ornament better, and in the end, not as much gold will be used as if the leaf were laid flat.

When the frame is covered with gold, take a small piece of absorbent cotton and press down the gold on the flat, smooth surfaces only.. For wide flats use brush No. 13, and starting at the leaf that was laid last, draw the brush gently over the gold. The weight of the brush will be sufficient pressure. Should the brush be drawn in the opposite direction, it will raise the laps of the gold.

For pressing down the gold on the ornaments, use brush No. 13; hold it perpendicular, and press the gold down fairly hard. It will then be necessary to apply a second layer of gold, to the ornamented surface, as the first layer will not entirely cover the ornaments. This second layer of gold should also be pressed down with brush No. 13.

SKEWING.

The frame is now ready for skewing. Skewing is brushing off the loose particles of gold leaf and, at the same time, brushing them on to the places where the gold has not adhered, so that the entire surface will be covered.

Skewings are the particles of gold which have been brushed off.

Take a clean piece of paper, at least a foot larger each way than the frame. Put it on the bench and on it place the frame. This paper is to catch the particles of gold (skewings) that fly off during the process, and to give a clean surface on which to brush them together.

Use brush No. 10 and work on the flats first. The gold has already been pressed down. Go over these parts with the brush, using a rubbing motion, just enough to remove the loose particles and smooth the gold. On the ornaments, first use brush No. 14 to break up the gold, then with brush No. 10 rub over gently, and dab down and around them, using a downward and at the same time, a brushing stroke.

This will make the gold smooth, and at the same time brush out loose particles. Places will now be found which the gold has not covered. To cover these,

brush together the skewings on the paper; and it will be found that, by placing the brush on them, and squeezing the hair together with the finger and thumb, many of the skewings may be picked up. Put these on the places which are imperfectly covered and skew over again. Keep close watch of the tops of the ornaments, to see that the gold is not being rubbed off when skewing the hollows.

When the frame is well skewed, take the brush No. 14 and dust out all particles of gold on to the paper. Gather these up and put into a cardboard box for future use. It will save considerable gold leaf if the skewings are saved and used in gilding other frames.

They may be used to gild cracks in the leaf; also places around the ornaments which cannot be reached when laying the gold with the tip.

Do not try to cover a space one-half inch square or larger with the skewings. If this is done, the work will look cloudy. On such a place it is always better to lay a piece of gold, and then brush in with skewings and skew.

Take brush No. 14 and dust off all loose gold. Next, look carefully at the places to be burnished, and if there are any particles of gold on them, wipe off with a cloth wet with benzine, taking care that the cloth does not touch the parts that are *not* to be burnished.

APPLYING FINISH SIZE.

Now coat the parts of the frame that are gilded in oil gold, with finish size Formula No. 18. Use brush No. 9, and, when once the gold is covered and partly dry, do not go over it again with the brush. If this is done, it will look muddy and will pull up the gold.

Do not allow this finish size to touch the places to be burnished: in case it does, it forms a coat which is brittle and is liable to chip off when the burnisher is used.

After the finish-size has been applied, allow it to dry; then give the parts of ornaments to be burnished two more coats of gold burnish size (Formula No. 9, using brush No. 3) and allow the first coat to dry before applying the second. After these two coats have been applied, do not sandpaper, but allow them to remain as they are. When the last coat is on and thoroughly dry, the gold may then be laid for burnishing.

LAYING GOLD FOR BURNISHING.

For this purpose use brush No. 4. This is a double brush, made by fitting a quill camel's hair letterer on the end of the handle of a camel's hair lacquer brush. The combination is called a "Gilder's pencil."

With the larger brush, apply the gilding liquor (Formula No. 13) to the gold size that is on the ornaments, while keeping the smaller brush dry, and using it only for tucking the gold around the ornaments to be burnished, in case it should adhere to the top of the ornament that is not to be burnished.

Take the cushion and cut a piece of gold (as instructed on page 50) a little larger than the ornament to be burnished, and pick it up on the gilder's tip. In picking up the gold, use as little of the tip as possible. If the piece of gold is one inch wide, do not allow the hair to catch on the gold more than one quarter of an inch.

If right handed, hold the cushion with the left hand, and with the right, use the tip to pick up the gold. Then place the tip with the gold on it between the first and second fingers of the left hand. It will then be in good position to take quickly with the right hand when wanted.

Thoroughly wet the gilder's pencil in the gild-

ing liquor. (See Formula No. 13.) Apply it to the ornament to be burnished. Do not brush it hard, but flow the gilding liquor on freely. As soon as this is done, take the tip which already contains the gold and apply it to the ornament. Do this as quickly as possible, as the gold must be on before the gilding liquor dries off. Do not attempt to put this liquor on all the parts that are to be burnished, and then lay the gold; but put the liquor on one or two places, and then apply the gold as quickly as possible.

In applying the gold, do not let the tip come in contact with the gilding liquor that is on the ornament; for, if it does, the gold will stick to the tip and cannot be handled. It will be found by practise that the gold can best be applied to burnished parts by a light, quick stroke.

The motion might be likened to that which one would make in testing a hot flat iron. One would not let one's finger rest on the iron, but would give it a light quick touch. It is just such a stroke as this which is used in laying gold for burnish.

Then, when proceeding, use the smaller brush on the gilder's pencil to push down the gold wherever it is necessary.

After the gold is laid on the ornaments to be burnished, set the frame aside and allow these parts to become thoroughly dry. This will take from one to three hours. When dry, it will be ready to burnish.

BURNISHING ORNAMENTS.

The burnish is produced by rubbing with an agate burnisher, using a forward and back motion, and bearing on hard enough to bring out a bright burnish. If too little pressure is used, it will not burnish, and too much pressure will rub off the gold. A very little practice will enable one to get the desired result. The agate burnishers are made in many shapes, suitable for different kinds of work. It is best to have two or three, but one of the medium size, with a crook, can be made to answer most of the requirements of the picture frame gilder. First burnish the ornaments. Do not allow the burnisher to touch the oil gold, for if it does, the gold will come off.

After the ornaments have been thoroughly burnished, brush off the loose gold with brush No. 14. Places where the burnish gold size is not covered may be found at the edges of the ornaments burnished. In such cases, cover these places with a fine quality of bronze. (Formula No. 16, apply with brush No. 1.)

BURNISHING HOLLOWS AND BEADS.

The concave parts of a moulding are called hollows; the narrow raised parts, whether round or square, are called beads. On new work, the flats, hollows, and beads do not require any preparing with thin or thick white. Go over them with sandpaper and dust thoroughly; then prepare with gold burnish size as described in preparing ornaments for burnishing. That is, use two coats of gold burnish size (Formula No. 9). To apply this to hollows and beads, use brush No. 3. For flats use brush No. 5. Then smooth with No. 00 sandpaper, as instructed on page 20. After smoothing, dust thoroughly, and give two more coats of gold burnish size. Remember that the last two coats are not to be sandpapered or smoothed. In applying gold burnish size to flats, hollows and beads; have enough size on the brush to cover the hollow or bead from one mitre of the frame to the other. Beginning at one corner, draw the brush lightly and gradually bear down, so as to give the section as even a coat as possible.

Lay the gold in the manner described on page 32.

GILDING NEW WORK.

When a frame is first gilded, the gilder generally has to put on it certain preliminary work that it was not necessary to mention when giving instructions for regilding. When a new frame is given to the gilder, he should first turn it face down on the bench, and see if the outside bottom edge has been chamfered off. If not he should either plane it, or sandpaper the rough edges of the whiting. The ornaments should be looked at closely. Many places may be found, where they have not been glued to the frame properly, and a space will show between the ornament and the whiting. These places should be filled with putty. Often the ornaments will be found to be rough and imperfect; then it will be necessary to sandpaper them. This must be done carefully, and the ornament kept as near to the original shape as possible. When reaming out nail holes for puttying, see that the whiting has not been cracked by the joiner when he nailed the frame together. Such cracks should be cut out and puttied as described on page 10. It should not be necessary to put thin white on the flats, as they are always supposed to be in first-class condition when they leave the factory; but from now on, the process of preparing a new frame is the same as that of an old frame for regilding. Thin white,

thick white, smooth, sandpaper, dust, &c., but instead of using shellac clear coat Formula No. 5, use glue clear coat Formula No. 6. This is applied hot. Place the cup in a pan of water and heat, use brush No. 6 and apply hot. Dab it down in and around the ornaments, and see that they are well covered. If they are not well covered, the oil size will soak into the compo and the gold will not stick. When applying, do not work over the clear coat many times, for it chills quickly and may foam, and then would leave a rough surface when dry. Wipe the clear coat off places that are to be burnished. This can be done with the finger as it is being applied. If a little is left on it will not cause any trouble, unless it should foam. When clear coating ornaments that are close to flats, wipe off the flats before the clear coat that gets on them is dry. The flats must have a coat, but not until the ornaments have all been coated. It is applied to the flats, as one would paint, starting from one mitre of the frame, draw the brush along the flat to the next mitre, using plenty of clear coat, and taking care to have it hot. If it should foam while being applied, add three or four drops of turpentine. Shellac clear coat Formula No. 5 can be used on new work, but Formula No. 6 is preferable. After the clear coat is dry, proceed the same as in re-gilding old frames.

MATTE GILDING.

Matte gilding is used only for plain parts which have no ornamentation, flat surfaces, hollows and beads.

If a plain lining is to be matted, it must be done before it is nailed to the frame. Never try to gild a frame in matte that has two or more sections, after the parts have been put together. Gild and finish each section separately, and nail together afterward.

First, make sure that the flats are well sandpapered with No. 00 sandpaper; and well dusted. With brush No. 5 give the surface that is to be matted, two coats of gold burnish size. When each coat is dry, prepare some No. 00 sandpaper as described on page 20 and smooth the gold size. Do not try to remove it, but give it a burnish effect.

Dust thoroughly with Brush No. 12, then with a clean cloth, wipe off all particles of dust not removed by the duster. Take brush No. 5 and give the flats a coat of matte gold size No. 1 (Formula No. 11), heated hot. After this size is perfectly dry, lay the gold on the same as described in laying gold for burnish (see page 32), allowing the gold to lap over at least one-eighth of an inch. When applying the gilding liquor, use brush No. 5; and do not wet the entire flat that is to be gilded at once. Wet a small section, an inch or so

longer than the piece of gold, and be sure to apply the liquor after laying each piece. Should the beginner attempt to lay two or more pieces with one wetting, it probably would result in dry lays, and such places would have to be patched. After laying the gold, set the frame aside to dry. When dry, take a wad of cotton-batting and wipe off all loose particles of gold. Then with brush No. 5 give the frame a coat of hot matte gold size No. 2 (Formula No. 12). When dry, apply a second layer of gold leaf as described above, and when this is dry wipe off again with cotton-batting. The frame is then ready for a coat of finish size (Formula No. 18).

If, at any time, when laying matte or burnish gold, a place called a "dry lay" is found where the gold did not adhere, it may be patched with a small piece of gold. Use brush No. 1 and wet with gilding liquor the size that is exposed. Be careful, however, to wet only the part that contains no gold. After it is dry, smooth off with cotton batting. Flaws on burnished places can be patched in the same manner.

The effect of matte and oil gilding is practically the same. The matte is a little smoother, but as it takes twice as much gold, the oil process is generally used.

1

GILDING WITH DUTCH METAL.

Metal leaf and Dutch metal are names given to a combination of copper, zinc, and other metals beaten into leaf, and used as an imitation of gold leaf. As it is difficult to obtain satisfactory results on smooth surfaces, this leaf is used mostly on ornaments; and as it is not beaten out as thin as gold leaf, it is not necessary to use a tip to handle it. When applying it to ornaments, gilders usually pick it up with the fingers; but when using it on smooth surfaces, like the backs of frames, a stick covered with velvet or plush is very convenient, and helps to lay it smoother and quicker than if handled with the fingers. This stick should be about two inches by six, and one-eighth of an inch thick; with a piece of velvet or plush around one edge.

When using this stick, the leaf is not blown out on the cushion. A book of leaf is fastened to the cushion as described on page 49, and the velvet edge of the stick is placed on a leaf about one inch from the edge of it. Then a slight puff of breath will blow a portion of the leaf so that it will lap over the edge of the stick; then it can be picked up and applied to the frame.

The preparation for gilding with metal is the same as for gilding in oil with gold, except that you will require a different oil—one that is made for the purpose,

called "Metal oil." This oil is heavier, and does not dry as quickly as that used for gold. Aside from that, you will proceed just the same as you would in laying gold. After the leaf is applied, do not shellac, but go over the frame with a lacquer, using brush No. 11. This is to protect the metal and give it the rich gold color desired. Either buy a lacquer for the purpose, or make it yourself. (Formula No. 19.)

APPLYING SILVER LEAF.

To finish a frame in silver leaf, proceed the same as when gilding with gold. It would be better to have the clear coat Formula No. 6 a little stronger. Equal quantities of stock size and water will be the right proportion. After laying the silver leaf, give the frame two good coats of shellac. If the silver is not well coated, it will tarnish. If the flats are more than one-fourth of an inch wide, it would be better to lay in matte.

As silver leaf is thicker than gold and requires more oil on the tip, have a piece of mutton tallow, and brush the tip across it occasionally. Do not use this tip for laying gold.

On many silver frames, a black color is put on the background of the ornaments, and the finish is then known as "oxidized silver." This black color is generally made from lamp black mixed with a weak glue size. Some gilders put a little blue gold size in it, thinking that it makes a better color. Brush it into the ornaments, and when they are dry, wipe off the tops with a soft cloth. The glue size must be very weak, or it will be difficult to wipe it off without taking the silver with it.

ROMAN GOLD GILDING.

Roman gold is the name given to a very fine grade of bronze powder. It is a bronze that not only gives a fine matte finish, but can also be burnished like gold.

While treating of this class of gilding, we would advise the gilder not to attempt the regilding of old frames in this finish; as the result would not be satisfactory. Gilding with Roman gold should be done on new work only.

Prepare the frame the same as for gilding in gold; that is, putty, thin white, thick white, smooth and sandpaper; but do not clear coat or shellac. After it is dusted, give the entire frame a coat of red clay size (Formula No. 17 with brush No. 6). (This red clay can be purchased from J. J. Heins, 6 Sullivan Street, New York City.) After applying the red clay, heat the Roman gold powder (Formula No. 15) and apply with brush No. 10, taking care to get the bronze down, in and around the ornaments. Give the frame two or three coats of the Roman gold, or enough to cover it well. After it is dry, take brush No. 15 and rub fairly hard over the frame in order to remove all surplus bronze. See if the parts are well covered; and if not, coat over again until they are. Then take a piece of sandpaper, No. 0, and remove the bronze from the places which are to be burn-

ished. Dust the frame and give these places two coats of burnish size (Formula No. 14, brush No. 3), as instructed on pages 20 and 21. When dry, give these parts two or three coats of Roman gold (Formula 15, brush No. 10), and when these are dry, burnish, as described on page 33.

The frame must now be given two coats of banana liquid as a protective. This liquid is a sort of white lacquer, and is for sale in all paint stores. It was named from its peculiar odor, which is something like that of bananas. Some dealers have put a very inferior article on the market, and as it is necessary that a good quality be used for this purpose, the gilder should be careful to get the best. See page 67.

Apply this banana liquid with brush No. 10. Go over the entire frame, burnishes and all. Use freely and be sure that the frame is well covered. However, take care that there are no runs on the flats. Brush them over carefully and leave them as smooth as possible.

A word about this Roman gold powder. There are many qualities on the market, and at many different prices. J. W. Gillis Co. of Rochester, N. Y., import a very fine grade, and are selling it to their customers. It is the bronze from which they obtain their artistic effects in Roman, Etruscan and antique gold. They sell it for 50c per ounce, or \$6.00 per pound.

GILDING WITH LIQUID BRONZE.

Gilding with bronze powder is the cheapest class of gilding, and as it is very easy to apply, many frames are finished in that way. While it cannot be recommended where first-class work is desired, a very good effect can be produced when it is properly handled. A frame finished entirely with bronze will look cheap, but if there is a fair amount of gold burnish on the frame, and the right quality and color of bronze is used, a result can be obtained that to the ordinary observer, will pass for gold.

There are hundreds of bronzes on the market, of every shade and quality, and as each dealer has his own name for the different shades, it is not possible to indicate which should be used. A fine quality of what is called "matte bronze" is best for frame work, but the gilder must select the color that will best secure the result he desires.

If it is intended to put gold burnishes on the frame, these places should be prepared, according to instructions on pages 20 and 21, before the bronze is applied. Then the bronze must be removed from these places with sandpaper before the gold size is put on.

First give the frame a coat of shellac (Formula No. 5, with brush No. 11), and when it is dry,

a coat of liquid bronze (Formula No. 16, brush No. 10). Then allowing each coat to dry before applying the next, give a second, third or even a fourth coat of the liquid bronze, if a very nice effect is desired. The last coat should be thinner—that is, about one-half teaspoonful of bronze to five or six tablespoonsful of banana liquid. This liquid bronze must be flowed on evenly, and care must be used to avoid runs on the flats. When the last coat is dry, give the smooth parts of the frame a coat of shellac (Formula No. 18). It is not necessary to shellac the ornaments.

BLEACHING OLD ENGRAVINGS.

To know how to restore old engravings is always valuable knowledge to the picture framer; and, if one will follow our instructions and use our formula No. 23, one will be able to restore to its former condition an engraving that is yellow and stained from age. This is a branch of business from which a good profit may be derived; as the time and money expended is but a trifle compared with the price that is charged for the bleaching. Most old engravings, though very valuable are stained and disfigured and their owners are willing to pay well to have them restored. Pictures which can be restored are: Steel engravings, etchings and photo-gravures. It is not advisable to try to bleach a picture that is printed on India paper; as the India paper is very thin and is mounted on a heavier paper. If one were to try to bleach one of this kind, the India paper would come off from the other and there would be much difficulty in remounting it.

A pan about two inches deep and large enough to allow the picture to lay flat, will be required. One thirty-two by forty-two inches, would be large enough for a picture thirty by forty and of course would do for anything smaller. A pan as large as this, should be made of galvanized iron, and it must be made to hold water.

First, place the picture in the pan, face side up and

pour into the pan enough water to cover the picture. Leave the water in until the picture is saturated; then pour it off. Next, pour into the pan a sufficient quantity of formula No. 23 to cover the picture. Allow the picture to remain in the solution until the stains entirely disappear. Then pour off the solution.

There should be a large bottle provided in which to keep the solution, as it can be used several times. After pouring off the solution, place the pan containing the picture under a faucet of running water, and allow it to wash for ten minutes. If running water is not convenient, put the print through eight or ten changes of water. Remove the print from the pan, and place it on a clean paper. Take a large piece of blotting paper and absorb all the water possible from the picture. If desired, it may then be mounted.

THE GILDER'S TIP.

The gilder's tip is a flat brush, about four inches wide, with hair one and one-half to two and one-half inches long. It is used to pick up and put the gold leaf on the frame or article to be gilded.

Tip No. 16 is used for laying the gold on burnishes, and places where only small pieces of gold are used. Tip No. 17 for oil work.

The hair on this tip should always be kept straight and smooth. The best and most convenient way to do this, is to place it flat against the face, put the palm of one hand against it and with the other hand draw it away, thus straightening the hairs. Do this after using; and when the gilding is finished, put the tip between the leaves of a book and keep it there until needed again.

Before using the tip to pick up gold, flatten it in the same manner, but instead of the face, use the top of the head, and draw the tip between the palm of the hand and the hair. The hair of the head has more or less natural oil, and some of it gets on the tip, which causes the gold to adhere more readily. While using the tip it is well to occasionally brush it across the hair. This will keep it in good condition and make it work better.

THE CUSHION AND HOW TO USE IT.

The gilder's cushion is a padded board, usually about five by nine inches, covered with specially prepared sheep-skin. There is a leather loop on the under side with which to hold it, and a parchment shield around one end to form a protection for the gold when blown into it from the book. Some gilders prefer to use a cushion without a shield. A strip of leather three-quarters of an inch wide is fastened across the cushion. A section, one-fourth of an inch by three inches is cut out of the strip, and by passing a match under the strip and through the thread, with which the book is sewed, one or more books of gold leaf may be fastened to the cushion. Then with the gilder's knife the gold is taken out of the book, a leaf at a time, and blown flat on the cushion.

When using the cushion, the thumb of one hand—say the left—should be put through the leather loop on the underside. This leaves the fingers free to hold the tip and knife. The most convenient way is to hold the tip between the first and second finger, and the gilder's knife between the third and fourth finger. After becoming accustomed to this arrangement, it will be found that when the gold has been cut and the knife placed between the fingers of the left hand, the tip is right there to be taken back by the same movement. Before picking up the gold, brush the tip once across the hair; and when the tip is put back in the left hand, after applying the gold leaf to the frame, the same movement will bring back the knife to spread out and cut the gold.

CUTTING THE GOLD.

To cut the gold leaf will require some practise and patience. First place a leaf of gold on the front part of the cushion and blow it flat, as described on page 24. Now place the edge of the gilder's knife on the leaf where it is to be cut, press down fairly hard, and push the knife away from you about an eighth or a quarter of an inch; then draw it toward you until it leaves the gold entirely. If the knife is raised in the act of cutting, and before it is through and away from the gold, it may pick up the gold and cause trouble.

It is a good plan to draw the blade of the knife through an empty gold leaf book, pressing the book while doing so. A reddish powder, which is used to keep the gold from sticking to the paper, clings to the leaves of the book. This will also prevent the gold from sticking to the knife. We would advise occasionally rubbing the leaves of a book on the cushion, to prevent the gold from sticking.

FORMULA NO. I STOCK SIZE.

This is a preparation that is used in many of the other formulas; and, as much of it is required, a quantity should be kept on hand, ready for use.

For mixing, it will require a bowl that will hold at least a quart. Fill the bowl three-fourths full of Heins' white glue and pour on cold water until covered, then allow it to stand until the glue is soaked. Place the bowl with its contents in a pan of water, and heat until the glue is thoroughly melted. Stir well, and allow it to cool.

FORMULA NO. 2 GILDER'S PUTTY.

Into a cup, put two tablespoons full of melted stock size, and six tablespoons full of water. Place the cup in a pan of water, and heat. Stir well. This is called "putty size." Now put a pound or more of bolted whiting in a box. A cigar box will do. This box should be marked, so that it will not be used for anything but the making of gilder's putty. With the fist, make an impression in the whiting deep enough to contain the putty size. Pour the hot putty size into the impression, and with a stick, stir the whiting into the putty size until it becomes the consistency of thick dough. Rub some whiting on the hands, take the putty up, and mix it evenly by rolling it between the hands. After it is thoroughly mixed, take a piece of cotton cloth; dampen it with water, and roll the putty in it. This will preserve it for several days. A crust that will form over it within a day or two, should be cut off, and underneath will be found moist putty, ready for use.

When puttying a frame, take a piece of putty about the size of a walnut. As the heat of the fingers causes the putty to gradually become dry, slightly moisten it from time to time as needed. Most gilders use spittle for this purpose. There is nothing poisonous in any of the preparation used in gilding, so one need not be afraid of being injured.

FORMULA NO. 3 THIN WHITE.

Into a cup, put two tablespoons full of melted stock size ,and seven tablespoons full of water. Place the cup in a pan of water, and heat until melted and thoroughly mixed. Then stir in four level tablespoons of bolted whiting and strain through fine cheese cloth.

When applying this preparation, it must be kept hot. There is no danger of it becoming full of pin holes, but there are times, especially in winter, when it becomes foamy. When this happens, add three or four drops of turpentine.

FORMULA NO. 4 THICK WHITE.

Into a cup, put one tablespoonfull of melted stock size, and three and one-half tablespoonsfull of water. Place the cup in a pan of water and heat. After it is melted, take the cup out of the pan, and stir in nine tablespoonsfull of bolted whiting and three tablespoonsfull of china clay. Mix thoroughly, and strain through a very fine cheese cloth. If unable to obtain china clay, use twelve tablespoonsfull of whiting. To use this thick white, place the cup in a pan of hot water, but do not have any fire under it. As soon as it is melted, take it out of the pan. Never allow it to become hot. If it is too hot when applied to the frame, it becomes full of little holes, called by gilders "pin holes." When the thick white pin holes, add ten drops of turpentine, which will generally overcome the trouble. However, if it continues to pin hole, throw it away, and mix another lot. If one gilds on top of a pin hole surface, the result will be very poor work; work that would never be accepted in a first-class shop. So be very careful to watch this preparation while melting.

FORMULA NO. 5 SHELLAC (CLEAR COAT) FOR REGILDING.

To one-half cup of liquid shellac, such as can be purchased at any paint or drug store, add one-quarter cup of alcohol. Stir with brush before using.

Either orange or white shellac may be used. Many gilders prefer the orange, as with that, any places that have not been covered can more readily be seen.

If the gilder wishes to buy dry shellac and cut it himself, he should take a wide mouthed bottle and fill it with dry shellac, then pour in enough alcohol to cover it. This should be allowed to stand until the shellac is dissolved or cut. It will do no harm if it is shaken occasionally. This liquid shellac will be stronger than the shellac that is for sale, and it will be necessary to put one-half cup of alcohol to one-half cup of shellac to get the required strength.

FORMULA NO. 6 CLEAR COAT FOR NEW WORK.

Into a cup put four tablespoonsfull of melted stock size, and five tablespoonsfull of water. Place the cup in a pan of water and heat. Pour in one-half teaspoonful of alcohol while stirring. Apply hot with brush No. 6.

FORMULA NO. 7 RABBIT SKIN GLUE SIZE.

Into a large cup, put two ounces of rabbit skin glue, and one-half pint of water. Let it stand until soaked; then put the cup in a pan of water and heat until melted.

FORMULA NO. 8 GLUE SIZE FOR GOLD BURNISH WORK

Into a cup, put four tablespoonsfull of formula No. 7, and five tablespoonsfull of water. Place the cup in a pan of water and melt.

FORMULA NO. 9 GOLD BURNISH SIZE

Into a cup put one tablespoonfull of Heins' gold burnish size, (Blue Clay), and three tablespoonsfull of water. Mix thoroughly before adding three teaspoonsfull of Formula No. 8. Mix thoroughly, then strain through a very fine bolting cloth. When this preparation becomes set or chilled, place the cup in a pan of warm water and allow to stand until melted. Stir the size while in process of melting and do not allow it to become hot, or it will pin hole. A foam may form on it while melting. Four or five drops of alcohol will cut this foam and prevent pin-holing.

FORMULA NO. 10 OIL GOLD SIZE.

Open a can of Heins' oil size according to the directions which will be found on the outside of the can. There is quite a sediment, which must be stirred, until it is well mixed with the oil that floats on top. Then pour about two teaspoonsfull into a saucer, and add about one-fourth of a teaspoonfull of Japan dryer. This will give a harder surface on which to lay the gold, than would be obtained, were the size alone used. Stir the Japan into the oil thoroughly.

FORMULA NO. 11 MATTE GOLD SIZE NO. 1.

Into a cup one-half full of water, put a piece of stock size about the size of a pea, and one teaspoonfull of alcohol. Place the cup in a pan of water and heat.

FORMULA NO. 12 MATTE GOLD SIZE NO. 2.

Into a cup seven-eighths full of water, put a piece of stock size about the size of a pea, and one teaspoonfull of alcohol. Place the cup in a pan of water and heat.

FORMULA NO. 13 GILDING LIQUOR.

Into a tumbler, put eight tablespoonsfull of cold water and three teaspoonsfull of alcohol.

Grain or denatured alcohol may be used in all of the preparations.

FORMULA NO. 14 SIZE FOR ROMAN GOLD BURNISHES.

Into a cup put two tablespoonsfull of Formula No. 7 and four tablespoonsfull of water. Place the cup in a pan of water and melt. Then stir in four tablespoons level full of Heins' Burnish gold size. Mix thoroughly.

FORMULA NO. 15 SIZE FOR MIXING WITH ROMAN GOLD.

Into a cup put one teaspoonfull of melted glue, Formula No. 7, one-half pint of hot water and one ounce of Roman gold powder. Stir until well mixed. If you wish it a little stronger, use more glue.

FORMULA NO. 16 LIQUID BRONZE

Into a cup put six tablespoonsfull of banana liquid, and stir into it one teaspoonfull of bronze powder. Mix thoroughly.

FORMULA NO. 17 RED CLAY SIZE.

Into a cup put one tablespoonfull of Heins' red clay, and three tablespoonsfull of water. Mix thoroughly, before adding, four teaspoonsfull of Formula No. 8. Mix thoroughly, then strain through a very fine bolting cloth. To use, place the cup in a pan of warm water, but do not allow it to become hot.

FORMULA NO. 18 FINISH SIZE.

To one-half cup of alcohol, put one teaspoonfull of white shellac, cut as described in Formula No. 5.

FORMULA NO. 19 LACQUER FOR DUTCH METAL.

Cut orange shellac, as described in Formula No. 5. Cut one teaspoonfull of powdered gamboge in six tablespoonsfull of alcohol, and one teaspoonfull of powdered dragons blood in six tablespoonsfull of alcohol. Then to one tablespoonfull of the cut shellac and one tablespoonful of the cut gamboge and one teaspoonfull of the cut dragons blood, add four tablespoonsfull of alcohol. Mix thoroughly. The gilder may have to vary the proportions a little, to get the desired color, as these ingredients are not always of the same strength.

Gamboge and dragons blood can be bought at any drug store, in stick form, and should be broken up with a hammer, before cutting.

FORMULA NO. 20 COMPOSITION.

This is the material used for making ornaments and is generally known as compo. It is necessary to have two pots. In one, put three pounds of Heins' white glue and one quart of water. After it is thoroughly soaked, place it on the stove to melt. Into the other, put two pounds of rosin and one pint of rosin oil, and place it on the stove to melt. After they are melted separately, allow the rosin to cool for about fifteen minutes then put it into the glue and mix thoroughly. Into a box large enough for the purpose, put fifteen or twenty pounds of bolted whiting. Bank this whiting around the sides to prevent the mixture from sticking to the box. Then pour the mixture into it and stir with a stick until it becomes the consistency of dough, and thick enough to handle. Sprinkle some whiting on a board or table, and knead the compo until thoroughly mixed. In time the compo becomes very hard. It is softened by subjecting it to the action of live steam. In factories and in places where it is in constant use, a steam box is used. Where only used occasionally, a simple way is to make a stretcher and cover with cheese cloth. Put the compo on this stretcher and place it over a pan of boiling water, and over it put a box to keep the steam in.

To make a compo casting, first oil the mould either

with kerosene or crude oil. If the compo has been steamed, put some whiting on a board or bench and place the compo on it. Then work some of the whiting into it, first with a stick and then with the hands, kneading it thoroughly. Before handling it, cover the hands with whiting to prevent it sticking to and burning the hands. Roll out a sufficient quantity to make the casting, and place it on the mould. Now take a piece of hard wood two or three inches longer and an inch or two wider than the mould, and an inch thick. This is called a casting board. A press will be required. An ordinary letter press is very good for the purpose. Moisten the face of the casting board with a damp cloth and place it over the compo on the mould then place both mould and casting board in the press, the casting board being on top. One learns by practice how much pressure is necessary. After taking from the press separate the mould from the casting board by striking one end of the casting board on the bench or press. Have the mould underneath, and keep one hand under it to catch it. Pressing once is all that is usually required, but if the ornament is very deep it may be necessary to replace the cast in the mould and press over again to obtain a good cast. This should be allowed to harden for ten or fifteen minutes, and it will then be in condition to be cut off with a sharp carving knife. The ornament can be sliced from the background and is then ready to be glued to the frame.

FORMULA NO. 21 COMPOSITION MOULDS.

These moulds are used when it is necessary to replace ornaments that have been broken off and are missing. Take a piece of soft compo, (Formula No. 19) at least one inch thick, and one inch larger each way, than the ornament that is to be copied. After coating the ornament with crude oil press the compo on it, so as to get as good an impression as possible; then remove the compo from the ornament and set it aside to harden. This will take two or three days. The gilder will then be able to supply the missing parts by using this mould to make a casting, as described in Formula No. 19. If only a small piece is needed, it may not be necessary to put it in the press, as the ornament can be formed by pressing the compo into the mould with the fingers.

FDRMULA NO. 22 CEMENT MOULDS.

First see that the ornament which is to be copied is on a solid base. If the ornament is one by twelve inches, it should be glued securely to a piece of hard wood at least three inches wide, fifteen inches long and one inch thick. Next prepare a box to hold the mould. This must also be of hard wood (Maple is as good as any). It should be about two and a half or three inches larger each way than the ornament; or about three and one-half by fifteen inches for a one by twelve ornament; and one inch or more in thickness. Dig out from this block an excavation sufficiently large to take the ornament. For a one by twelve ornament, the excavation should be at least one and one-half by twelve and one-half, and one-eighth inch deeper than the deepest part of the ornament. The edges of the excavation should be under cut to prevent the cement from pulling out of the box.

Into a three quart stew pan with handle, put three cups full of orange shellac, one and one-half cups full of rosin, one cup full of black lead, and three tablespoons-full of pine tar. Melt over a medium fire, constantly stirring with a stick. On a smooth board or bench, put two cups full of powdered pumice. Form this pumice with the hands into the shape of a dish, about seven or eight inches in diameter, and into it pour the melted shellac, etc., the contents of the stew pan. With two sticks work the pumice into the cement, and when cool enough,

work with the hands until thoroughly mixed. Then put into the stew pan and melt over again. Put a little more pumice on the bench and repeat the mixing. It becomes a mass that can be rolled out as one would roll out putty. Roll out enough to fill the excavation in the box. Now coat the ornament and the top of the box with kerosene. Put the cement in the box and carefully press the ornament into the centre of it. Take it out and see if it is in the right place, then put it back again and place it in the press squeezing it lightly. Do not leave the ornament in the mould more than thirty seconds as the cement is very hot and will soften the compo if it is left in too long. After the ornament has been out for a minute or so, put it back and squeeze again, this will have to be done several times before the cement becomes hard and smooth.

After the first or second squeeze it will be noticed that there is too much cement in the box. It will require a hot iron to remove it (an old flat file is very good for the purpose). Put it in the fire until nearly red hot, and with it you will be able to scrape off the superfluous cement.

When finished the cement should be flush with the top of the box. This process requires considerable patience and perseverance. This quantity of cement will make about two moulds of the size mentioned. The cement can at any time be melted and used over again. Use care, however, not to burn it. If a mould should crack, it can be softened by holding over fire and by pressing over again.

FORMULA No. 23 SOLUTION FOR BLEACHING OLD
ENGRAVINGS.

Dissolve three ounces of chloride of lime in hot water and run through filtering paper. Then put it with five ounces of carbonate of soda into five gallons of water. If this solution is kept after using, it should be put into a bottle or bottles and well corked, or it will loose its strength. The chloride of lime and carbonate of soda in powder form should also be kept in bottles. A better plan, is to get a few cents worth of the lime and soda from a drug store as required.

BRUSHES.

- No. 1. $\frac{1}{8}$ inch Round Extra Camel's Hair Water Color Brush.
- No. 2. 3-16 inch Round Extra Camel's Hair Water Color Brush.
- No. 3. $\frac{3}{8}$ inch Round Camel's Hair Lacquering Brush.
- No. 4. $\frac{1}{2}$ inch Round Camel's Hair Lacquering Brush with $\frac{3}{8}$ inch Round Camel's Hair Lettering Brush.
- No. 5. $\frac{7}{8}$ inch Flat Camel's Hair Lacquering Brush.
- No. 6. $\frac{3}{4}$ inch Flat Superfine Artists' Bristle Brush.
- No. 7. 1 inch Flat Superfine Artists' Bristle Brush.
- No. 8. $1\frac{1}{4}$ inch Flat Superfine Artists' Bristle Brush.
- No. 9. $\frac{3}{4}$ inch Single Chisel Fitch Brush.
- No. 10. 1 inch Double Chisel Fitch Brush.
- No. 11. $1\frac{1}{2}$ inch Double Chisel Fitch Brush.
- No. 12. $2\frac{1}{2}$ inch Flat Paint Brush.
- No. 13. 1 inch Camel's Hair Duster.
- No. 14. $1\frac{1}{4}$ inch Badger Blender.
- No. 15. 2x8 inch Bristle Clothes Brush.
- No. 16. $1\frac{1}{2}$ inch Camel Hair Gilders' Tip.
- No. 17. 2 inch Camel Hair Gilders' Tip.

CARE OF BRUSHES.

Brushes which have been used in shellac, or bronze, should be cleaned in alcohol. Brushes which have been used in size, glue or oil, should be well washed in soap and water, and thoroughly dried before being used again. A piece of paper wrapped, after cleaning, around the hair of shellac and bronze brushes will help to keep them in condition.

To indicate the proper brush to use for each operation in the process of gilding, is rather a difficult task. Catalogue numbers cannot be given, as each manufacturer has his own method of numbering. The descriptions given on page 66 should be sufficient; but in most of the smaller cities and towns, it is not always possible to get what is required; and in such places, the beginner will have difficulty in selecting the best for the purpose.

To provide for this condition, the authors have put in a stock of brushes, and other articles that the beginner will require, and will supply all who wish them. On the following page will be found a list of articles, that we have called "The Gilder's Outfit." This shows the number of brushes that will be needed, and the approximate cost of each. Prices of other articles, such as Gold, Silver, Dutch Metal, Bronze, Glue, Shellac, Banana Liquid, etc., will be furnished on application.

THE GILDER'S OUTFIT.

1 Gilder's Cushion	\$1 25
1 Gilder's Knife (Single or double edge)	50
1 Agate Burnisher	85
3 No. 1 Brushes, 7c each	21
2 No. 2 Brushes, 8 each	16
1 No. 3 Brush	14
1 No. 4 Brush	25
3 No. 5 Brushes, 20c each	60
2 No. 6 Brushes, 17c each	34
2 No. 7 Brushes, 22c each	44
3 No. 8 Brushes, 27c each	81
1 No. 9 Brush	22
3 No. 10 Brushes, 32c each	96
2 No. 11 Brushes, 48c each	96
1 No. 12 Brush	25
1 No. 13 Brush	57
1 No. 14 Brush	55
1 No. 15 Brush	25
1 No. 16 Brush	20
1 No. 17 Brush	22
1 Putty Stick	10
1 lb. Oil Gold Size	75
1 lb. Burnish Gold Size	75

\$11 33

This entire outfit will be sent by express for \$9.75.

The articles have been carefully selected, and are all of the finest quality. Any item will be sent by mail (postage paid) on receipt of price.

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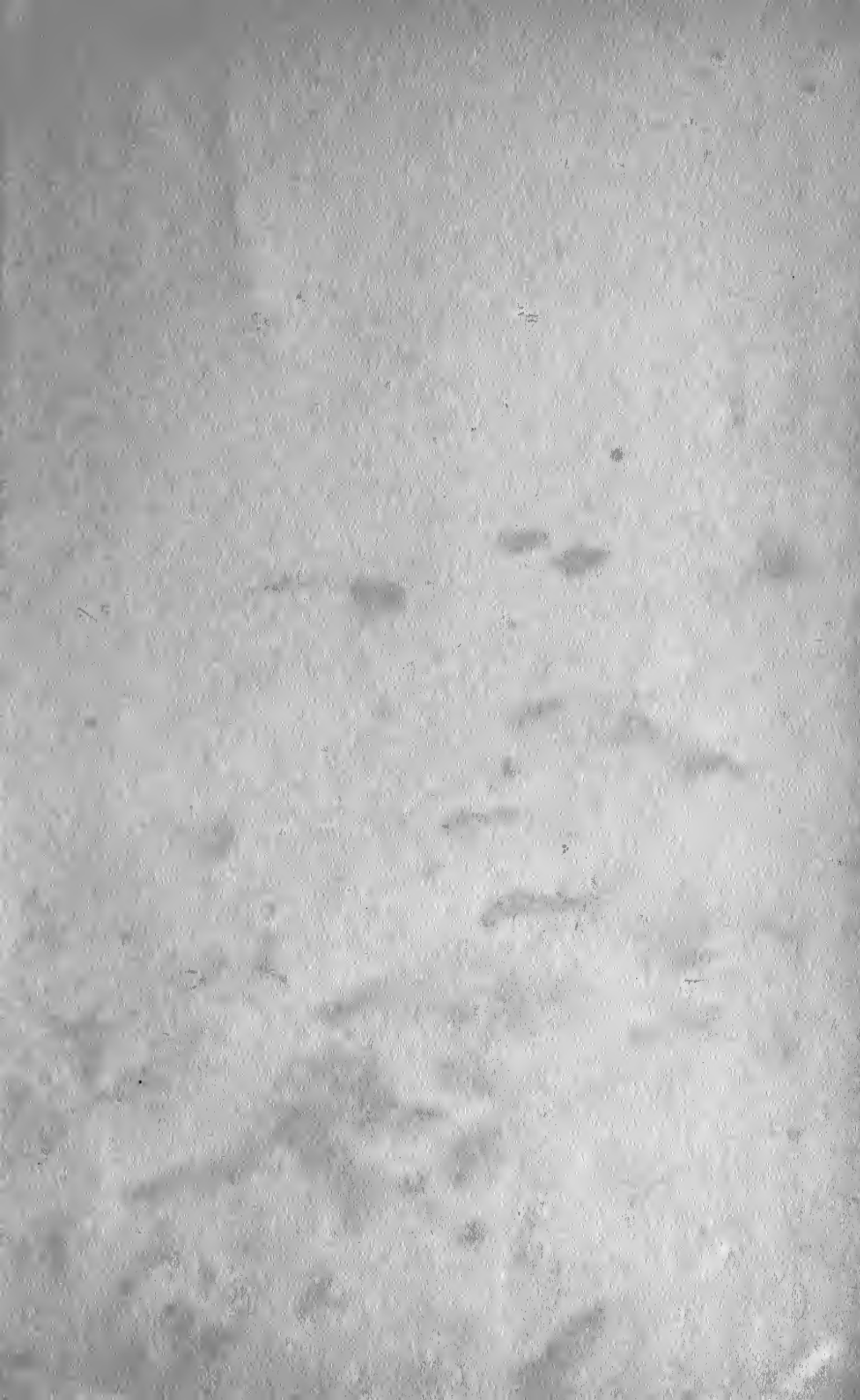
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